BFR93A/BFR93AR

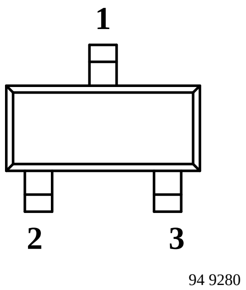
Silicon NPN Planar RF Transistor

Applications

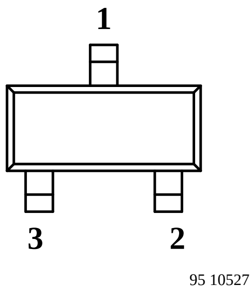
Wide band amplifier up to GHz range.

Features

- High power gain
- High transition frequency
- Low noise figure



BFR93A Marking: + R2
Plastic case (SOT 23)
1= Collector; 2= Base; 3= Emitter



BFR93AR Marking: + R5
Plastic case (SOT 23)
1= Collector; 2= Base; 3= Emitter

Absolute Maximum Ratings

Parameters	Symbol	Value	Unit
Collector-base voltage	V_{CBO}	20	V
Collector-emitter voltage	V_{CEO}	12	V
Emitter-base voltage	V_{EBO}	2	V
Collector current	I_C	50	mA
Total power dissipation $T_{amb} \le 60°C$	P_{tot}	200	mW
Junction temperature	T_j	150	°C
Storage temperature range	T_{stg}	–65 to +150	°C

Maximum Thermal Resistance

Parameters	Symbol	Value	Unit
Junction ambient on glass fibre printed board (25 x 20 x 1.5) mm^3 plated with 35 μm Cu	R_{thJA}	450	K/W

Electrical DC Characteristics

T_{amb} = 25°C

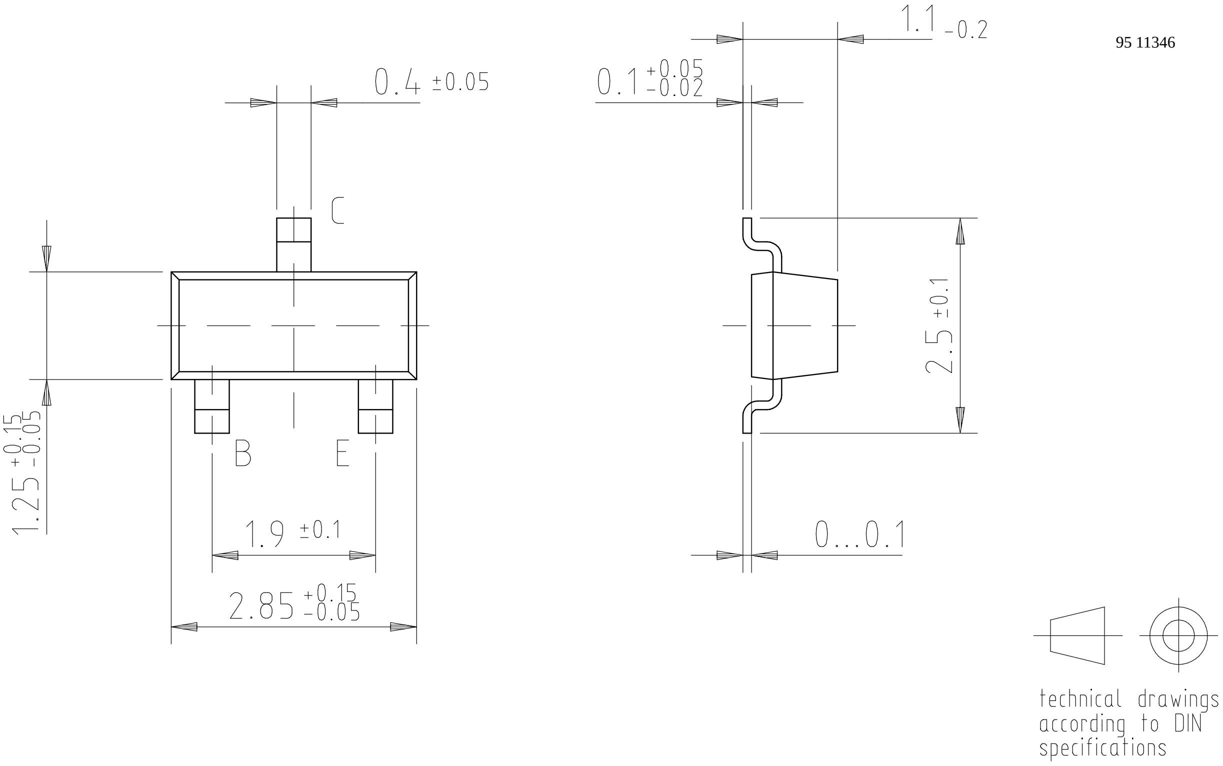
Parameters / Test Conditions	Symbol	Min.	Typ.	Max.	Unit
Collector-emitter cut-off current V_{CE} = 20 V, V_{BE} = 0	I_{CES}			100	μA
Collector-base cut-off current V_{CB} = 10 V, I_E = 0	I_{CBO}			100	nA
Emitter-base cut-off current V_{EB} = 2 V, I_C = 0	I_{EBO}			10	μA
Collector-emitter breakdown voltage I_C = 1 mA, I_B = 0	$V_{(BR)CEO}$	12			V
Collector-emitter saturation voltage I_C = 50 mA, I_B = 5 mA	V_{CEsat}		100	400	mV
DC forward current transfer ratio V_{CE} = 5 V, I_C = 30 mA	h_{FE}	40	90	150	

Electrical AC Characteristics

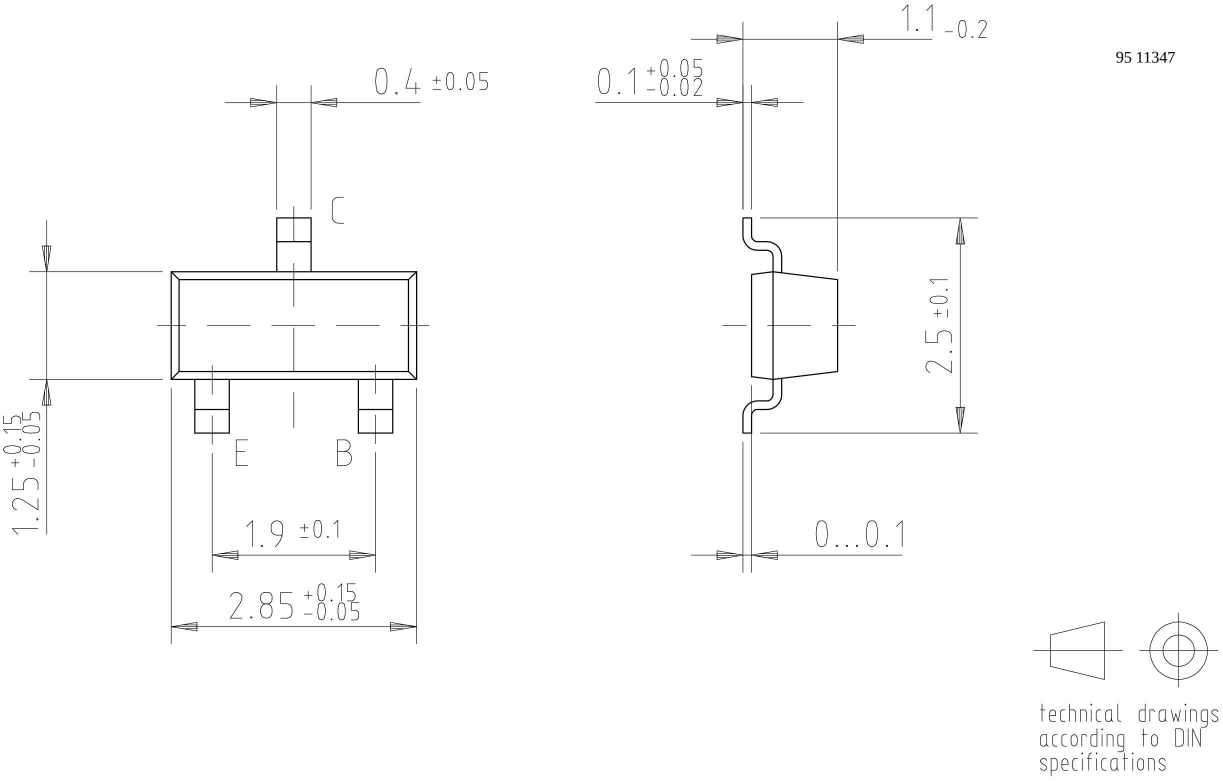
T_{amb} = 25°C

Parameters / Test Conditions	Symbol	Min.	Typ.	Max.	Unit
Transition frequency V_{CE} = 5 V, I_C = 30 mA, f = 500 MHz	f_T		6		GHz
Collector-base capacitance V_{CB} = 10 V, f = 1 MHz	C_{cb}		0.45		pF
Collector-emitter capacitance V_{CE} = 5 V, f = 1 MHz	C_{ce}		0.2		pF
Emitter-base capacitance V_{EB} = 0.5 V, f = 1 MHz	C_{eb}		1.5		pF
Noise figure V_{CE} = 8 V, Z_S = 50 Ω, f = 800 MHz, I_C = 5 mA I_C = 25 mA	 F F		 1.6 2.1		 dB dB
Power gain V_{CE} = 8 V, Z_S = 50 Ω, Z_L = Z_{Lopt}, I_C = 25 mA, f = 800 MHz	G_{pe}		14		dB
Linear output voltage – two tone intermodulation test V_{CE} = 8 V, I_C = 25 mA, d_{IM} = 60 dB, f_1 = 806 MHz, f_2 = 810 MHz, Z_S = Z_L = 50 Ω	$V_1 = V_2$		260		mV
Third order intercept point V_{CE} = 8 V, I_C = 25 mA, f = 800 MHz	IP_3		31		dBm

Dimensions of BFR93A in mm



Dimensions of BFR93AR in mm



Ozone Depleting Substances Policy Statement

It is the policy of **TEMIC TELEFUNKEN microelectronic GmbH** to

1. Meet all present and future national and international statutory requirements.

2. Regularly and continuously improve the performance of our products, processes, distribution and operating systems with respect to their impact on the health and safety of our employees and the public, as well as their impact on the environment.

It is particular concern to control or eliminate releases of those substances into the atmosphere which are known as ozone depleting substances (ODSs).

The Montreal Protocol (1987) and its London Amendments (1990) intend to severely restrict the use of ODSs and forbid their use within the next ten years. Various national and international initiatives are pressing for an earlier ban on these substances.

TEMIC TELEFUNKEN microelectronic GmbH semiconductor division has been able to use its policy of continuous improvements to eliminate the use of ODSs listed in the following documents.

1. Annex A, B and list of transitional substances of the Montreal Protocol and the London Amendments respectively

2. Class I and II ozone depleting substances in the Clean Air Act Amendments of 1990 by the Environmental Protection Agency (EPA) in the USA

3. Council Decision 88/540/EEC and 91/690/EEC Annex A, B and C (transitional substances) respectively.

TEMIC can certify that our semiconductors are not manufactured with ozone depleting substances and do not contain such substances.

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